

SUMMARY

S.1 INTRODUCTION AND BACKGROUND

The Los Angeles to San Diego travel corridor links California's three most populous counties - Los Angeles, Orange and San Diego. Travel along this corridor is served largely by Interstate 5 (I-5) and the Los Angeles to San Diego (LOSSAN) rail corridor¹. The rail corridor is used by Amtrak intercity passenger rail service, Metrolink and Coaster commuter rail services, and Burlington Northern and Santa Fe Railway (BNSF) freight service, and loosely parallels I-5 from Los Angeles Union Station through Orange County to San Diego's Santa Fe Depot.

For the purposes of this document, intercity rail service refers to the passenger rail service, operated by Amtrak and jointly funded by Amtrak and the California Department of Transportation (Department) and known as the Pacific Surfliner. This service provides daily passenger service between San Diego, Los Angeles, Santa Barbara, and San Luis Obispo (and intermediate communities between these cities). Commuter rail refers to the services provided by Metrolink in Los Angeles, Orange and north San Diego Counties, and Coaster in San Diego County. Since three services regularly utilize the corridor, the expansion plans of each service, and those of BNSF (the freight operator), must be taken into account when considering improvements along the rail corridor.

Southern California's existing transportation network is currently operating at or near its design capacity, which results in congestion. Building additional capacity is both expensive and increasingly problematic. This condition results in highway and railroad travel delays, has a negative impact on the region's economy, and can result in environmental impacts and the reduction of the quality of life for all. Improvements to the LOSSAN rail corridor would help meet the Southern California region's transportation demands of today, as well as help to address the expected increase in intercity travel demand rising out of the growth in population over the next 20 years and beyond. This document describes the costs, benefits, and environmental impacts of improving the LOSSAN rail corridor.

The Department commenced this environmental review process to comply with federal and state laws, in particular the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. § 4321 et seq.) and the California Environmental Quality Act (CEQA) (Cal. P.R.C. § 21000 et seq.). NEPA requires federal agencies to prepare an environmental impact statement (EIS) for proposed actions that have the potential to cause significant environmental impacts. Because of possible funding and regulatory action, the Federal Railroad Administration (FRA) is the lead federal agency, working with the Department as the lead state agency, for the environmental review required by NEPA and related statutes. The FRA has further determined that the preparation of a Tier 1 program-level EIS for the proposed Rail Improvements is the appropriate NEPA document because of the comprehensive nature and scope of the corridor improvements proposed by the Department and the conceptual stage of planning and decision-making. The decisions related to advancing and ultimately constructing the proposed Rail Improvements would constitute major federal actions requiring environmental review under NEPA for several federal agencies in addition to the FRA. The U.S. Environmental Protection Agency (EPA),

¹ While the LOSSAN corridor is officially the "Los Angeles - San Diego - San Luis Obispo" Rail Corridor, the area of the corridor studied and described in this document is that portion between Los Angeles Union Station and San Diego Santa Fe Depot, and within this document, use of the term "LOSSAN" will refer to that segment only.

U.S. Army Corps of Engineers (USACE), and the U.S. Fish and Wildlife Service (USFWS), among others, have been active participants throughout project planning and the preparation of this Program EIS.

The proposed Rail Improvements are subject to environmental review under CEQA, and the Department is both the project sponsor and the lead agency for purposes of CEQA compliance. The Department has determined that a program environmental impact report (EIR) is the appropriate CEQA document for the project at this conceptual stage of planning and decision-making, which includes selecting a preferred rail alignment option in some locations and identifying options for phasing the future development of the Rail Improvements. No permits will be sought in this phase of environmental review. If the Rail Improvements Alternative is selected at the conclusion of the Program EIR/EIS, project development will continue with project-specific environmental documentation to assess in more detail the impacts of reasonable and feasible alignment and station options in segments of the system that are proposed for implementation.

S.2 STUDIES LEADING TO THE PROGRAM EIR/EIS

Since 1998, four planning and feasibility studies have been completed that are relevant to the LOSSAN corridor. The first of these was conducted in 1998-1999 by the California High-Speed Rail Authority (Authority), building on previous work done in 1996 by the past California Intercity High-Speed Rail Commission. This study determined that dedicated² high-speed rail service in the LOSSAN rail corridor south of central Orange County was problematic and costly to construct. The 1999 study also concluded that conventional (non-electric) rail improvements in the LOSSAN corridor should be further evaluated.

The Department and others prepared the second and third planning studies, addressing proposed capital improvements and service goals for the state rail system, including the LOSSAN corridor. These rail plans, Amtrak's California Passenger Rail System 20-Year Improvement Plan (2001) and the Department's California State Rail Plan (2002) (State Rail Plan), helped form the basis for the Department's alternatives development, and led to the initiation of this program-level environmental review process.

The Department's Notice of Preparation (NOP) for this Program EIR/EIS was released March 11, 2002, and the Notice of Intent (NOI) was published in the Federal Register on March 20, 2002. Scoping activities for the LOSSAN corridor were conducted between April 2 and April 30, 2002 (scoping period). The scoping process identified areas of potential concern related to the proposed LOSSAN corridor improvements. Throughout the corridor, comments consistently indicated the need for an improved transportation system focusing on safety and new alignments located away from environmentally sensitive areas.

Finally, the Department's LOSSAN Corridor Strategic Plan (Strategic Plan) (2003) provided a corridor-wide review of all alternatives. This planning document served as a means to consider and refine alternatives in the ongoing PEIR/PEIS process. A series of public workshops provided an additional opportunity for public outreach, beyond that provided during the Scoping Process, and fostered better communication and understanding among stakeholders. In addition to the public workshops, meetings with elected representatives were held, as well as with working groups comprised of transportation agencies and other stakeholders, including state and federal resource agencies, FRA, and the Authority.

² "Dedicated" service would not share tracks with existing passenger and freight rail services.

The Strategic Plan served as the Department's alternative evaluation document, allowing for the elimination of certain design options at key locations within the corridor (San Juan Capistrano, Dana Point/San Clemente, Encinitas, Del Mar), so as to focus on a range of feasible alternatives. As well, through the Strategic Plan's consultative process, new alignments were presented by local working groups, leading to consideration of additional design options in San Juan Capistrano and Del Mar.

S.3 PURPOSE OF AND NEED FOR IMPROVED INTERCITY TRANSPORTATION IN SOUTHERN CALIFORNIA

The purpose of the proposed Rail Improvements in the LOSSAN corridor is to develop a faster, safer, and more reliable passenger rail system that provides added capacity in response to increased travel demand through the year 2020 between Los Angeles, Orange, and San Diego Counties (between Los Angeles Union Station and San Diego Santa Fe Depot).

As stated in the current State Rail Plan and the Strategic Plan, the Department has described its overall objectives and policies for intercity rail improvements. These objectives and policies include the following:

- Increase the cost-effectiveness of State-supported intercity passenger rail systems.
- Increase capacity on existing routes.
- Reduce travel times to attract additional riders and to provide a more attractive service.
- Improve the safety of State-supported intercity rail service.

In addition to the policies set forth in the State Rail Plan, minimizing impacts to natural resources (e.g. wetlands, wildlife habitat) and human communities are also important objectives of the Department regarding any improvement within the rail corridor.

The capacity of Southern California's intercity transportation system (shown in Figure S.3-1) is insufficient to meet existing and future demand, and the current and projected future congestion of the system will continue to result in deteriorating air quality, reduced reliability, and increased travel times. The intercity rail system has not kept pace with the tremendous increase in population and tourism in the state. The interstate highway system and passenger rail system serving the intercity travel market are currently operating at or near capacity and will require large public investments for maintenance and expansion in order to meet existing demand and future growth over the next 20 years and beyond. Simply stated, the need for improvements to the corridor relates to the following issues.

- Future growth in travel demand for passenger trips between Los Angeles, Orange and San Diego Counties, as population increases from 16.6 million (2003) to 19.3 million by 2020, and trips rise from 36 million in 1997 to approximately 47 million by 2020³.
- Rail capacity constraints that will result in congestion and travel delays. Roughly 41-percent of the corridor is currently single-tracked, causing delays for passenger and commuter rail services as well as freight movements.

³ Charles River Associates Incorporated, *Independent Ridership and Passenger Revenue Projections for High Speed Rail Alternatives in California*, January 2000.

Figure S.3-1
Los Angeles to San Diego Intercity Travel Routes



- Unreliability of travel stemming from congestion and delays, weather conditions, accidents and other factors that affect the quality of life and economic well-being of residents, businesses, and tourism in Southern California. The improvements proposed in this document would increase on-time performance for rail services and reduce delay for both automobiles and trains.
- Increasing frequency of accidents on intercity highways and passenger rail lines in congested travel corridors, and the potential for accidents at at-grade crossings as highway and rail traffic volumes increase. While rail is already one of the safest modes of transportation, improvements such as new grade separations and pedestrian crossings will reduce auto-train accidents and improve safety.
- Poor and deteriorating air quality and pressure on natural resources as a result of expanded highway construction, motor vehicle use and congestion. Moving passengers by rail produces significantly less pollution per passenger mile than by automobile and can help reduce air pollution. As well, mitigating and reducing the impacts of rail service and protection of important coastal and environmental resources has been a consideration when selecting and evaluation improvements.

S.4 ALTERNATIVES

The Draft Program EIR/EIS compares two alternatives: a No Project/No Action (No Project) Alternative and a Rail Improvements Alternative. Each alternative is described in the following paragraphs.

S.4.1 No-Project Alternative

The No Project Alternative (No Project) is the baseline for comparison of the Rail Improvements Alternative, and represents the LOSSAN region's transportation system (highway and conventional rail) as it would be after implementation of programs or projects that are currently programmed in Regional Transportation Plans (RTPs) and that are funded for implementation and expected to be in place by 2020. This financially constrained level of infrastructure improvement (which includes federal, state, regional, and local funding) is analyzed together with the significant growth in population and transportation demand that is projected to occur by 2020.

All the intercity passenger rail system improvements identified in the State Transportation Improvement Plan (STIP) and in the Department's California Intercity Rail Capital Program for implementation in the LOSSAN corridor prior to 2020 are included in the No Project Alternative and are identified in Table S.4.3-1.

Some No Project Rail Improvements have already been addressed in project NEPA and/or CEQA documentation, while others are in the project environmental review process. For example, the Run-Through Tracks project at Los Angeles Union Station is being addressed in a project-specific EIR/EIS.

Currently, 41 percent of the 127.5 mile portion of the LOSSAN Corridor under study consists of single track. Following the completion of all projects listed under the No Project Alternative in Table 2.4.3-1, 25 percent of the corridor will remain single-tracked. State-of-the-art, non-electric, clean air, steel-wheel-on-steel-rail technology will continue be used along the corridor, similar to the technology being operated by passenger services along the corridor today. As track and signaling permits, train speeds will rise (though existing equipment is capable of achieving speeds of 110 to 125 miles per hour (mph) today).

By 2020, rail service along the corridor is projected to consist of 16 intercity trains, between 9 and 29 commuter trains (depending on the segment of the corridor), and 4 to 6 freight trains each day in each direction, as is shown in Figure S.4-1 on page S-8. Service quality at this volume of trains is uncertain, with increased risk of delay risks associated with train operations, breakdowns or rail maintenance activities.

S.4.2 Rail Improvements Alternative

The Rail Improvements Alternative represents the proposed action, and was developed by studying a comprehensive range of alignment and station options. Screening of these options was accomplished with public input during the scoping period and with preparation of the LOSSAN Strategic Plan (2003). The Department reviewed and concurred with decisions regarding the LOSSAN region made by the Authority in its studies related to a statewide high-speed train system. For more information on this process, see Chapter 2 of the Program EIR/EIS Report. The Authority's work led to the elimination of some initial design options, train technologies, and several new potential rail corridors within the LOSSAN region. The Department agreed with the decisions of the Authority in the Strategic Plan and, therefore, eliminated the same options from further evaluation in this Program EIR/EIS.

As in the No Project Alternative, state-of-the-art, non-electric, clean air, steel-wheel-on-steel-rail technology will be used along the corridor, similar to the technology being operated by passenger services along the corridor today. While the No-Project Alternative would reduce the percentage of single track, the Rail Improvements Alternative would eliminate the remaining single-tracked segments (which represent key bottlenecks), resulting in a double-tracked rail corridor, with four tracks between Los Angeles Union Station and Fullerton. Trains will be able to achieve their maximum operational speeds of up to 110 to 125 miles per hour (mph), reducing trip times. Elimination of at-grade crossings in many locations and state-of-the-art safety and signaling systems throughout the corridor will also be incorporated.

As shown in Figure S.4-1 on the following page, 2020 rail service volume along the corridor is projected to consist of 16 intercity trains, between 9 and 29 commuter trains (depending on the segment of the corridor), and 4 to 6 freight trains each day in each direction. The improved system as a result of the Rail Improvements Alternative will be better able to accommodate the projected train volume, allowing for reduced trip time and more reliable service, as well as create the flexibility to respond to train breakdowns or maintenance needs.

To accommodate the existing and projected growth in the ridership along the corridor and provide a reliable and competitive alternative to the automobile, a series of operational and safety improvement options has been developed for the LOSSAN corridor. In certain areas along the corridor, multiple options are considered to meet the goals and purpose and need of the project. In such cases, these options in the Rail Improvements Alternative are categorized into "High" and "Low" level ranges. The highest level of improvement is based on combining the alignment/construction options within a rail segment that would involve the most extensive infrastructure investment and/or construction complexity. For example, where there is an at-grade option and a trenching option in the same general alignment, the trenching option was used in the highest-level route and the at-grade option was used in the lowest-level route. Where two tunnel options are the only options in one sub-segment, the longer tunnel was included in the highest-level route. In this way, a range of potential corridor-wide impacts is presented for combinations of improvement options.

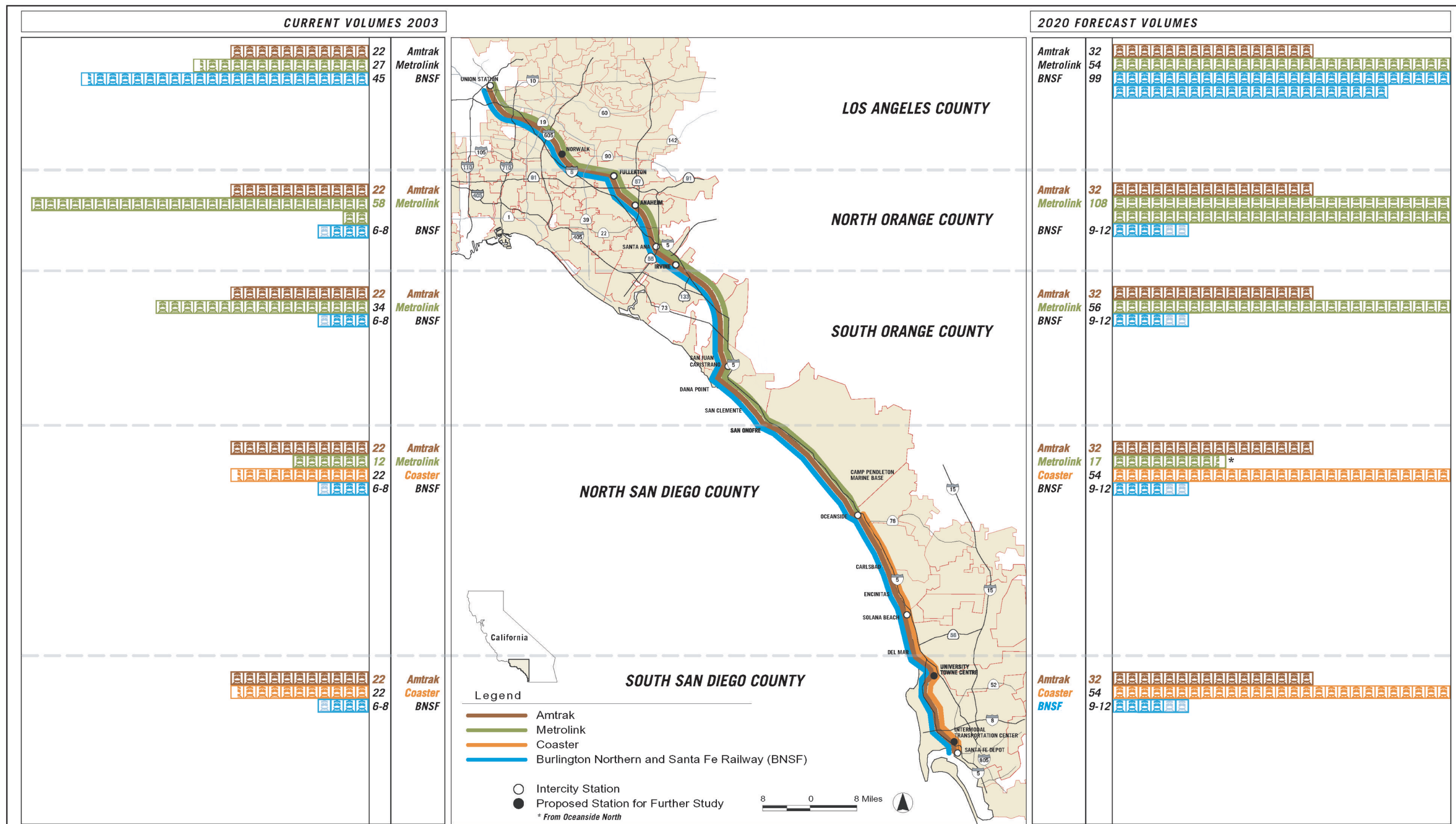


FIGURE S.4-1
Existing and Future Train Volumes on the LOSSAN Corridor
 LOSSAN Rail Corridor Improvements
 Program Environmental Impact Report / Environmental Impact Statement

The cost to implement the proposed Rail Improvements Alternative is estimated to range between \$3.8 billion and \$5.4 billion (2003 dollars), depending on whether the Low- or High-Build Rail Improvements Alternative is implemented or a combination of either. The cost estimate includes right-of-way, additional track, tunneling, trenching, stations and mitigation.

The process used to define and assess alternatives has been extensive and thorough, and included a series of public scoping meetings and the formation of an interagency group comprised of representatives from eight key federal and state agencies:

- U.S. Environmental Protection Agency
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- National Marine Fisheries Service (NOAA Fisheries)
- California Coastal Commission
- California State Parks
- California Department of Fish and Game
- State Water Resources Control Board (California)

The interagency group has met periodically during the Draft Program EIS/EIR development to discuss major issues from the perspective of each of their agencies and to provide input to the lead agencies and consultant team to help focus the analysis and streamline the review process, and have assisted in:

- Defining the scope of the Program EIR/EIS
- Reviewing and providing input to the Purpose and Need Statement
- Reviewing and providing input to the technical methods of analysis and study area definition
- Identifying substantive issues of particular concern
- Suggesting sources of information and data relevant to their agency
- Defining avoidance, minimization and mitigation strategies
- Reviewing and providing input to the screening process and definition of alternatives to be analyzed in this EIR/EIS
- Reviewing and providing input on preliminary findings pertinent to agency expertise
- Identifying procedural requirements and permits or approvals necessary for subsequent phases of environmental review.

The Department, together with FRA and the Authority, also invited input from regional and local agencies within the project area. Regional transportation agency Board meetings and working-group meetings have provided forums for discussion of the environmental process and the development of alternatives that could meet travel needs in the LOSSAN region. These meetings have been held in San Diego, Oceanside, Orange County and Los Angeles to provide

convenient on-going opportunities for regional and local participation and input. As a result of early public involvement, the following additional alternatives were developed:

- Trabuco Creek (San Juan Capistrano)
- Long Tunnel (Dana Point/San Clemente)
- South Orange County Inland Bypass
- Penasquitos Lagoon Bypass

Opportunities for public involvement and input in the environmental review process has also been thorough and on-going, through the Public Scoping meetings, through meetings with individual corridor cities and stakeholders, and through the five workshops conducted in cities along the corridor during the development of the LOSSAN Corridor Strategic Plan. The workshops provided the public with an overview of the corridor and the rail improvements under study, including information on the following topics.

- Purpose, Goals and Need for Improvements in the corridor.
- Corridor facts, including rail owners and operators and details on freight services, and current and projected weekday train volumes of each.
- Types of services provided (Intercity Rail, Commuter Rail, and Freight).
- Ranges of costs, rail performance issues, and community/environmental issues of projects throughout the corridor.
- Design options and alternatives at four key locations along the corridor where the range of options was sufficiently broad to allow the screening out of some options, the recommendations for screening, and the rationale and criteria used to reach the recommended screening decisions.
- The Planning Process, including timelines for the completion of the Strategic Plan and the Department's Program EIR/EIS.

S.4.3 Summary of Corridor Improvement Alternatives

The Draft document provides a corridor-wide comparison of the physical and operational characteristics and potential environmental consequences associated with the Rail Improvements Alternative's alignment and station options.

As previously mentioned, options in the Rail Improvements Alternative are further categorized into "High Build" and "Low Build" scenarios. There are numerous possible combinations of alignment and construction options evaluated in the Rail Improvements Alternative. The document describes corridor-wide potential impacts by grouping the many possible route alignment combinations between Union Station and San Diego, using combinations of the highest and lowest level of improvements that could occur within each rail segment.

The table below provides a summary of all LOSSAN rail corridor projects contained in the No Project and Rail Improvements Alternative (and High/Low ranges).

The table shows corridor Improvement Alternatives by area:

- Los Angeles Union Station to Irvine
- Irvine to San Clemente
- Camp Pendleton/Oceanside to San Diego Santa Fe Station

**Table S.4.3-1
Corridor Improvement Alternatives**

Segment/Alternative Considered	No-Project / No-Action Alternative*	“Low-Build” Rail Improvements Alternative	“High-Build” Rail Improvements Alternative
LA Union Station to Irvine (Central Orange County)			
	Existing Rail Corridor	Partially-grade separated system	Fully grade-separated system
L.A. Union Station Run-through tracks	X (All projects shown are programmed and assumed built by 2020)		
Continuous third main track from Union Station to Fullerton	X		
Double tracking along Lincoln Avenue in Santa Ana	X		
Addition of Fourth Main Track (including full grade separation)		X	X
Double Tracking and Curve Straightening (including Covered Trench in Orange and Santa Ana) (including full grade separation)			X
Double Tracking and Curve Straightening (including partial grade separation)		X	
Irvine to San Clemente (Central Orange County to Northern San Diego County)			
Double Tracking and Curve Straightening (including Tunnel beneath I-5 between Hwy 73 and Avenida Aeropuerto)			X
Double Tracking and Curve Straightening (including Covered Trench along Trabuco Creek and Avenida Aeropuerto)		X	
Dana Point Curve Straightening; San Clemente – Short Tunnel; Double Tracking		X	
San Clemente – Long Split Two Segment Tunnel with Station; Double Tracking			X
Camp Pendleton/Oceanside (Northern San Diego County) to San Diego			
Extension of double track at San Onofre	X		
Extension of double track in Oceanside	X		
Sorrento-Miramar double-tracking and curve realignment	X		

Segment/Alternative Considered	No-Project / No-Action Alternative*	"Low-Build" Rail Improvements Alternative	"High-Build" Rail Improvements Alternative
O'Neill to Flores double-tracking	X		
Santa Margarita River Bridge Replacement and double-tracking	X		
Del Mar Bluffs stabilization	X		
Double Tracking and Curve Straightening along existing alignment (including full grade separation) – Carlsbad/Oceanside			X
Double Tracking and Curve Straightening along existing alignment (including partial grade separation) – Carlsbad/Oceanside		X	
Double Tracking and Curve Straightening along existing alignment (including full grade separation) – Encinitas			X
At-Grade Double Tracking and Curve Straightening along existing alignment (including partial grade separation) - Encinitas		X	
Double Tracking and Curve Straightening (including tunnel along Interstate-5) – Del Mar			X
Double Tracking and Curve Straightening (including tunnel under Camino Del Mar) – Del Mar		X	
Double Tracking and Curve Straightening (including tunnel under Interstate-5 Freeway) – University Towne Centre		X	
Double Tracking and Curve Straightening (including tunnel under University City/Miramar Hill with new station) – University Towne Centre			X
Double Tracking and Curve Straightening; San Diego River Bridge		X	
Double Tracking and Curve Straightening; San Diego River Bridge; Trench between Sassafras St and Cedar St (includes partial or full grade separation)			X

S.5 OPERATIONS SUMMARY

The Rail Improvements Alternative will reduce train travel times and increase the capacity of the corridor, meeting the need for a safe and reliable mode of travel that would attract additional passengers to the rail services. Both the Low- and High-Build Rail Improvements Alternative would provide for competitive point-to-point travel times between Southern California's major intercity markets. Table S.5-1 below summarizes the point-to-point scheduled travel times between Los Angeles and San Diego, comparing the existing automobile and rail travel times with the No-Project, Low and High Build Rail Improvements Alternative. In addition to providing faster train travel, the improvements provided in both the Low- and High-Build Rail Improvements Alternative would enhance the connectivity and accessibility to the other transit modes and services when compared to the No-Project Alternative.

Table S.5-1
Estimated Point-to-Point Scheduled Travel Times
(Hours: Minutes)

	2020					
	Existing Condition		No-Project Alternative		Rail Improvements Alternative	
	Auto	Rail	Auto	Rail	Low	High
Los Angeles to San Diego	2:35	2:44	3:15	2:36	1:58	1:48

The automobile and rail travel times presented in Table S.5-1 represent the expected travel times between Los Angeles and San Diego. These are the projected travel times that attainable by intercity traffic if every automobile experienced only the average level of congestion along I-5 (e.g. with no additional delays due to accidents, bad weather etc.) and every passenger and freight train ran according to schedule. The rail travel times can vary dramatically based on several variables, such as unexpected train delays, train priorities, daily variations in train volumes specifically related to the freight operators, and maintenance-of-way windows. The existing condition and No-Project Alternative are most susceptible to these variations, as they provide fewer tracks than the Rail Improvements Alternative and thereby provide fewer opportunities for trains to use alternative tracks to bypass problem areas.

Under existing conditions intercity passenger rail travel between Los Angeles Union Station and San Diego takes almost 3 hours. This travel time is representative of single-track operations and demonstrates the delay that results from the interference between trains caused by having to wait along a siding for the passing of a train in the opposite direction. In the event of incidents, existing segments of single track can account for even more unreliability and delay in the travel times along the corridor, providing for an even slower travel time.

As shown in Table S.5-1, the No-Project Alternative shows a slight improvement in travel time for intercity passenger trains over the existing condition, mostly due to the provision of a third track between Hobart Yard in the City of Commerce and Fullerton. The model run performed for the No-Project Alternative, assumed that intercity passenger trains would continue to be given priority over freight. By following this operating practice, there was an increase in the proportion of freight trains operating outside of peak passenger hours, which are usually during the morning and early-evening periods. *Without this assumption, the corridor between Hobart Yard and Fullerton would not be able to provide the capacity required to accommodate the projected 2020 passenger train volumes under the No-Project condition.*

With the ridership along the corridor projected to surpass 5 million riders by the year 2020, the improvements currently identified and programmed for this corridor that are part of the No-Project Alternative would do little to relieve the corridor-wide capacity and reliability constraints, though reliability will improve for some train movements, including commuter rail services. As shown in Table S.5-1, without the proposed improvements included in either the Low- or High-Build Rail Improvements Alternative, little to no travel time savings for rail travel between Los Angeles and San Diego would occur along the corridor.

This lack of travel time savings is a direct result of the remaining segments of single track that will still exist in Southern Orange and Central San Diego Counties. The existence of single track segments creates a considerable barrier to achieving faster travel times and improved reliability and connectivity because it causes significant delays in service as a result of trains having to wait at either end of a single tracked segment to allow for trains to pass in the opposite direction. This problem is further aggravated when certain situations (e.g. mechanical failures, track improvements) occur. These types of problems can halt all operations along the corridor because the operational flexibility of a second track is not available, that would otherwise be utilized to bypass the problem. The amount of delay associated with the presence of single track will only increase in the future with the introduction of more and more service onto the corridor.

Implementing the Rail Improvements Alternative provides a fully double-tracked rail corridor that offers passengers six specific advantages over the existing and No-Project Conditions, which maintain large segments of single track sections.

1. Increased capacity and average speed. The proposed corridor improvements would produce improved corridor geometrics, straightening the alignment wherever possible, but most importantly, would eliminate all single track segments, providing greatly increased capacity within the corridor. With these improvements, maximum speeds of 90mph would be possible in urban area (e.g. Los Angeles and San Diego) and 110 to 125mph in more rural areas (e.g. Camp Pendleton). Using the plans and profiles designed for the corridor improvements that incorporate the double-tracking and new geometrics, and track charts where necessary, an operational model was developed which determined the average speed for the Rail Improvements Alternative would increase an average of 16 to 22 miles per hour (mph) ranging from 63 to 69mph, depending on the improvements selected, when compared to existing conditions (47mph), and an average improvement of only 13 to 19mph when compared to the No-Project Alternative (50mph). These speeds are an average that incorporates the deceleration and acceleration rates for curves and station areas, and locations where speed restrictions may still be present.
2. A significant reduction in travel time. With increased speed there are improved travel times. Depending on which Rail Improvements Alternative are selected, passengers could save as many as 45 to 60 minutes on their trip between Los Angeles and San Diego when compared to the existing conditions. This is a 28 to 34-percent reduction in travel time. The No-Project Alternative only produces an average of an 8-minute (or 5-percent) savings in travel time. These times assume local service, which would stop at all scheduled stations. The Rail Improvements Alternative would be able to further decrease travel times by also allowing for the potential of skip-stopping/express service along the corridor.

3. Increased reliability. With the increase in capacity provided by double-tracking the length of the corridor, reliability would be significantly improved. Both safety and reliability would further increase in the High-Build Rail Improvements Alternative, as this alternative would grade-separate the length of the corridor, eliminating all remaining at-grade crossings.
4. Enhanced Multimodal Opportunities. Slow travel times and restricted reliability often deter people from using public transportation alternatives. With the improvement in reliability and travel times making it easier to reliably connect to other transit modes, passengers would be provided with additional transportation options.
5. Operational Flexibility. Two tracks allow for trains to pass each other easily along all segments of the corridor, eliminating the delay caused by waiting at single-track segments, resulting in shorter travel times and more service reliability. Service options such as express trains (that would skip some stops), and other improved choices for rail passengers would also be possible. The Rail Improvements Alternative would also allow for provide a platform for growth in train operations to accommodate as-yet-unplanned and unforeseeable future rail service expansions.
6. Reduction of Vehicle/Rail Conflicts. The Low-Build Rail Improvements Alternative will significantly reduce the number of at-grade crossings along the corridor, while the High-Build provides for a fully grade-separated corridor. Both of these improvements provide for a significant improvement in:
 - a. *Safety* – Reduces the number of vehicle/rail/pedestrian conflicts at crossings
 - b. *Reliability* – Reduces delays associated with vehicle/rail/pedestrian conflicts for both train and automobiles. Elimination of at-grade crossings reduces the delay of automobile traffic by preventing automobiles from stopping for trains at crossings.
 - c. *Noise* – Eliminates the need for horns at crossings
 - d. *Pollution/Energy* – By reducing the amount of delay for automobiles at grade crossings, the amount of pollution emitted by idling vehicles is significantly reduced.
7. Benefits to all Corridor Traffic. The LOSSAN corridor is shared by intercity trains (Amtrak), two commuter rail services (Metrolink and Coaster) and freight (Burlington Northern and Santa Fe). This document focuses on improving intercity travel; however, the Rail Improvements Alternative would provide the above benefits to all corridor users.

In summary, implementing the Rail Improvements Alternative would provide the LOSSAN corridor with the capacity, speed and reliability necessary to make it rail services a true attractive alternative to I-5 for intercity travelers, commuters and freight traffic from between Los Angeles, to Orange County and to San Diego.

The individual projects along the corridor identified as part of the Rail Improvements Alternative would provide varying levels of improvement to the corridor wide travel times. Several of the projects would provide significant travel time and reliability enhancements at locations such as those at San Juan Capistrano, San Clemente, Del Mar and Miramar Hill (University City).

Table S.5-2 details travel time savings by station segment to summarize how each of the projects within those segments contribute to the overall improvement of the corridor.

Table S.5-2
Station Segment Travel Time Comparison
(Hours: Minutes)

	Existing Condition	No-Project Alternative	Rail Improvements Alternatives	
			Low	High
Los Angeles to Fullerton	0:37	0:34	0:29	0:26
Fullerton to Anaheim	0:09	0:07	0:06	0:06
Anaheim to Santa Ana	0:10	0:09	0:06	0:06
Santa Ana to Irvine	0:12	0:11	0:08	0:08
Irvine to San Juan Capistrano	0:14	0:13	0:11	0:11
San Juan Capistrano to San Clemente	0:33*	0:09	0:07	0:05
San Clemente to Oceanside		0:24	0:17	0:16
Oceanside to Solana Beach	0:16	0:15	0:10	0:12**
Solana Beach to San Diego	0:33	0:34	0:24	0:18**
TOTAL	2:44	2:36	1:58	1:48

* San Clemente station not included in Baseline Condition.

** For the High-Build Rail Improvements Alternative, the travel time break is at the UTC station.

S.6 KEY ENVIRONMENTAL IMPACTS

The Program EIR/EIS describes the existing conditions for a number of areas of environmental concern and assesses the potential impacts to these areas from both the No-Project and Rail Improvements Alternatives. The following table summarizes by issue the Program EIR/EIS key environmental impact findings for the No Project Alternative and Rail Improvements Alternative:

**Table S.6-1
Summary of Key Environmental Impact/Benefits
For System Alternatives**

Key Environmental Issues	No Project Alternative	Rail Improvements Alternative ¹	Mitigation Strategy for Rail Alternative	Potential Significance for Rail Improvements Alternative	
				Before Mitigation	After Mitigation
Traffic and Circulation	Capacity is insufficient to accommodate the projected growth. All but one of the 8 intercity highway segments considered would operate at unacceptable levels of service with increased congestion, travel delays, and accidents over existing conditions. Congestion would increase considerably from existing conditions.	Congestion reduction on intercity highways as compared to the No Project Alternative. However, the analyses could not take into account potential use of the excess capacity by non-intercity (commuter, and short-distance) trips. Has the potential to help reduce the number of intercity automobile trips. Localized traffic conditions around stations impacted.	Encourage use of transit to stations. Work with transit providers to improve station connections.	Potentially Significant	Potentially Less than Significant
Travel Conditions (Travel Time, Reliability, Safety, Connectivity, Sustainable Capacity, Passenger Cost)	Longer travel times, more delay. Lower reliability due to increased dependence on the automobile. Increase in injuries and fatalities due to increase in highway travel. No net improvement to connectivity options. No significant increase in capacity for highway infrastructure, and significant worsening of congestion due to increased demand.	Travel time reduction as compared to the No Project Alternative. Greatest improvement in reliability due to higher reliability of the rail mode; additional modal option improves reliability for overall transportation system. Decrease in injuries and fatalities due to improvements to rail infrastructure Highest level of connectivity. Provide additional connections to existing modes, additional frequencies, and greater flexibility.	Not Applicable	Beneficial	Not Applicable

¹ Quantities are listed as ranges to represent the variation in potential impacts depending on the alignment options selected.

Key Environmental Issues	No Project Alternative	Rail Improvements Alternative ¹	Mitigation Strategy for Rail Alternative	Potential Significance for Rail Improvements Alternative	
				Before Mitigation	After Mitigation
Travel Conditions (continued)		Improved rail system would provide sufficient capacity to meet the representative demand and would provide additional capacity with minimal additional infrastructure. Overall savings in passenger costs of 39% on average compared to No Project. Intercity rail passenger costs are competitive with the automobile travel.			
Air Quality (Conformity Rule; tons of pollutants)	Emissions from locomotives in LOSSAN corridor are predicted to increase by 2020 approximately 85% over 2003 levels. Estimated CO 444 tons/year, NO _x 2,284 tons/year, TOG 123 tons/year; PM 81 tons/year; CO ₂ 168,749 tons/year.	No increase in locomotive traffic or emissions due to proposed project. Air quality benefits from reduced locomotive delays and idling time, vehicular idling at grade crossings. Construction impacts from PM emissions in nonattainment air basins.	Control of construction related emissions.	No impact/beneficial	Not Applicable
Energy Use	Energy consumption is estimated to increase by 2020 to 361,922 barrels of oil annual consumption for operation of locomotives in LOSSAN corridor.	No increase in number of locomotives traveling in LOSSAN corridor due to proposed project. Some energy consumption reduction would occur due to reduced congestion and grade separation of rail corridor. Construction energy consumption would be potentially significant use of nonrenewable energy.	Minimize grade changes in steep terrain areas to reduce the use of diesel fuel. Maximize intermodal transit connections to reduce automobile VMT related to the rail system. Develop and implement a construction energy conservation plan. Develop potential measures to reduce energy consumption during operation and maintenance activities.	Potentially Significant	Potentially Significant Unavoidable

Key Environmental Issues	No Project Alternative	Rail Improvements Alternative ¹	Mitigation Strategy for Rail Alternative	Potential Significance for Rail Improvements Alternative	
				Before Mitigation	After Mitigation
Land Use (Compatibility and Property Impacts)	Expansion of urban sprawl as population grows and congestion increases; development on open space. Existing barriers resulting from existing LOSSAN rail corridor in some communities and coastal areas would remain.	Most alignments highly compatible with land uses because of existing rail corridor or tunnel proposals. Small amount of property acquisition along existing rail corridor, some acquisition along new rights of way with one alignment option; between 5 and 7 mi. of improvements could affect high impact land uses. There will be additional impacts at remaining at-grade crossings	Continued coordination with local agencies. Relocation assistance during future project-level review.	Potentially Significant	Potentially Less Than Significant
Visual Quality	No predictable change to existing landscape. Existing visual impacts of rail corridor on beaches and coastal views would remain.	High sensitivity in scenic open space and residential coastal views. Some beneficial impacts would occur by removing existing track from beaches and coastal bluffs.	Design strategies to minimize bulk and shading of bridges Use of neutral colors and materials to blend with surrounding landscape features.	No Significant Impact	Not Applicable

Key Environmental Issues	No Project Alternative	Rail Improvements Alternative ¹	Mitigation Strategy for Rail Alternative	Potential Significance for Rail Improvements Alternative	
				Before Mitigation	After Mitigation
Noise	More vehicular traffic, rail and air operations from growth in the intercity demand generates more noise. Existing high impacts to noise-sensitive land use/populations would continue or worsen. Noise from train horns and warning bells at grade crossings would worsen due to projected doubling of rail service frequency by 2020.	20 miles of alignment length corridor-wide would have high impacts to noise sensitive land use/populations (most of which are already impacted by existing rail corridor); all can be mitigated to lower impacts. Noise increase due to increased speeds of trains in the LOSSAN corridor, compared with No Project. Frequencies would not change. Substantial noise reduction from existing conditions due to elimination of horn warning bell noise at grade crossings resulting from grade separation of existing rail line in most alignment options.	Consider sound barriers along noise sensitive corridors; good track maintenance for vibration.	Potentially Significant	Potentially less than Significant
Biology / Wetlands (Includes area within 1,000 feet (2,000 feet total for urban areas), .25 mile (0.5 mile total for undeveloped areas), and .5 mile (1 mile total for sensitive areas) on each side of alignment centerline.)	No predictable change from existing conditions.	Up to 28 acres of sensitive vegetation, and between 12,560-15,540 linear feet of non-wetland jurisdictional waters, 20-27 acres of wetlands, and 36-46 special-status species could be affected directly or indirectly. There could be benefits to lagoons from lagoon crossing design options that could reduce fill and increase tidal flow.	Work with resource agencies to develop site specific mitigation and impact avoidance strategies for project level review.	Potentially Significant	Potentially Significant Unavoidable

Key Environmental Issues	No Project Alternative	Rail Improvements Alternative ¹	Mitigation Strategy for Rail Alternative	Potential Significance for Rail Improvements Alternative	
				Before Mitigation	After Mitigation
Hydrologic Resources and Water Quality (Includes area within 100 feet on each side of alignment centerline 200 feet total).)	No predictable change from existing conditions.	Between 205 and 315 acres of floodplains, 11,760 and 13,650 linear feet of streams, and up to 12 acres of lagoons within 100 feet of proposed alignment options, plus some areas crossing the California Coastal Basin Aquifer.	Avoid or minimize footprint in floodplains; conduct project-level analysis of surface hydrology and coastal lagoons; Best Management Practices for construction as part of SWPPP.	Potentially Significant	Potentially less than Significant /Potentially Significant Unavoidable
Section 4 (f) 6 (f) (Parks, Wildlife Refuges) (Includes area within 900 feet on each side of alignment centerline [1,800 feet total].)	No predictable change from existing conditions.	From 29 to 33 Section 4 (f) or 6(f) properties could be affected. Most along existing rail corridor so impacts may be minimized. Some opportunity for new parklands to be created where rail would be removed from beaches.	All prudent & feasible avoidance alternatives will be analyzed Consider design options to avoid parklands; identify potential site specific mitigation measures.	Potentially Significant	Potentially less than Significant / Potentially Significant Unavoidable
Cultural Resources (Including Section 4(f) Historic Resources)	Low ranking for impacts to archaeological resources and historic property.	Medium to High ranking for potential impacts to archaeological resources and historic properties (Improvements would use existing rail corridor and stations; nearby resources developed in historic period). Tunnel options would avoid most impacts. Section 4(f) avoidance analysis may apply	Develop procedures for field work, identification, evaluation and determination of effects for cultural resources in consultation with SHPO and Native American Tribes.	Potentially Significant	Potentially Significant Unavoidable

Key Environmental Issues	No Project Alternative	Rail Improvements Alternative ¹	Mitigation Strategy for Rail Alternative	Potential Significance for Rail Improvements Alternative	
				Before Mitigation	After Mitigation
Growth Inducement	Not applicable.	<p>Rail improvement would not induce growth since they are proposed to accommodate and respond to projected rail service increases between 2004 and 2020.</p> <p>No known corridor development is contingent upon these proposed Rail Improvements.</p> <p>Rail Improvements may change rate of some development around new stations (potentially at University Towne Centre)</p>	Work with local communities to	No Significant Impact	Not Applicable
Public Utilities	No impact	Potential conflicts with 22 transmission lines, 44 gas lines, 5 ocean outfalls, and 2 major sewer lines. depending on alignments	Relocate or reconstruct or restore utility, consolidate several utilities underground into one conduit during relocation	Potentially Significant	Potentially less than Significant
Geology	Potentially susceptible to Seismic hazards; coastal bluffs in Del Mar and San Clemente would continue to require stabilization for reliable operation of existing rail service.	Potential seismic hazards, slope stability in cut sections. Would remove rail service from coastal bluffs in Del Mar and San Clemente, reducing stability problems.	Use of ground motion data and instruments. Routine maintenance of track, slope reinforcement.	Potentially Significant; Beneficial in coastal bluff areas.	Potentially less than Significant
Hazardous Materials	No impact.	Disposal, clean-up or remediation of exposure to hazardous materials during construction. Two Superfund, SPL or SWLF sites potentially affected by construction.	Detailed Initial Site Assessment, avoid sites where practicable, sub-surface investigation where needed to characterize sites and identify remediation	Potentially Significant	Potentially less than Significant

S.7 AREAS OF CONTROVERSY

The LOSSAN Corridor passes through three of the most densely populated counties in California, as well as through areas of sensitive environmental and community concern. Consequently, many of the projects identified in this Program EIR/EIS may be controversial. Specific issues, such as which of the proposed alignment and station options would be most appropriate in a given location would be decided following a project-level environmental review process for each proposed project, assuming a decision is made following completion of the Program EIR/EIS process to advance the Rail Improvements Alternative.

The following paragraphs highlight controversial project areas along the corridor and potential impacts and mitigations.

Los Angeles Union Station to Fullerton (North Orange County)

- Gateway Cities – Fourth main track – Right-of-Way to accommodate the provision of a fourth track would require the acquisition of some properties (largely industrial) in certain areas.

Fullerton to Irvine (North-Central Orange County)

- Orange, Santa Ana – Provision of grade separations (including possible trenches) in these communities would increase the quality of life along the rail corridor, with improved traffic circulation, vehicular/pedestrian safety, and greatly reduced noise impacts due to the elimination of the need to sound the train's horn as it approaches frequent existing at-grade crossings. However, there would likely be construction impacts and concerns about preservation of historic structures adjacent to the corridor.

Irvine to San Clemente (Central – South Orange County)

- San Juan Capistrano – Trabuco Creek alignment, Spur track to existing station (if I-5 alignment selected). There are potential resource concerns associated with a Trabuco Creek alignment, as well as how Commuter Rail service might be maintained to the existing San Juan Capistrano station if the I-5 alignment option is selected.
- Dana Point/San Clemente – Short Tunnel – There are continuing concerns regarding the Short Tunnel and its potential impacts to the Marblehead development in San Clemente, a planned desalination plant in Dana Point, as well as continuing issues with regard to beach access, stability of local bluffs, and noise issues.

Oceanside to San Diego (San Diego County)

- Lagoons throughout Coastal San Diego County. Any construction at these sensitive locations requires attention to best management practices to minimize environmental impacts. Design options for crossing these lagoons could have a net environmental benefit, allowing increased tidal flushing and the removal of existing creosote pilings.
- Coastal Rail Trail (Oceanside to San Diego). The Coastal Rail Trail (CRT), a project under development in San Diego County, is being located along a parallel alignment either within or adjacent to the existing railroad right-of-way. The CRT is currently in various stages of implementation with some segments already complete and in use. Depending on the projects and options selected, the Rail Improvements Alternative may require the CRT's temporary or permanent relocation. The CRT is mainly used for

transportation purposes, with incidental use for public recreational activities, including, but not limited to, landscaping, cycling, jogging, and walking. Since transportation in the primary use definition and recreational activities are incidental, Section 4(f) resource protections would not apply to the CRT.

- Carlsbad and Encinitas – Grade separations in Downtown areas include possible trench options, and both communities are sensitive to how these grade separations and their construction would impact pedestrian and vehicle movements in those areas.
- Del Mar/Torrey Pines – Camino del Mar and Penasquitos Bypass tunnels under consideration in this area would have lagoon impacts in either case, as well as potential visual, construction and noise impacts, the former along the existing corridor, and the latter introducing impacts along a new alignment. Potential benefits include removal of the track from the Del Mar bluffs, and design options that could reduce the environmental impacts within the lagoons by reducing fill and increasing tidal flow.

S.8 CONSEQUENCES FOR LOSSAN CORRIDOR WITHOUT IMPROVEMENTS

As shown in the Purpose and Need Statement and evidenced throughout the remaining sections of this document, conventional improvements to the LOSSAN rail corridor are needed to meet current and future transportation demands.

Without these improvements, increasing costs and capacity constraints will continue to hamper existing rail services, as well as hinder the expansion of new rail service to meet projected increases in travel demand. Known and potential Impacts include:

- Higher maintenance costs due to deferred replacement of timber bridges, as well as bluff stabilization along the corridor.
- Increased deaths, injuries, insurance and equipment costs due to at-grade collisions
- Continuing or worsening air quality due to rail traffic delays at road crossings and lack of track capacity for goods movement between the Ports of Los Angeles, Long Beach, and San Diego.
- Worsening on-time performance for commuter and intercity passenger trains and the inability to expand the number of passenger trains

Proposed improvements identified in this document could address and mitigate a number of community and environmental issues, including:

- Continuing noise impacts along corridor from the need to sound train horns when approaching at-grade crossings, especially in densely populated urban areas with closely spaced crossings.
- Inability to provide improvements in the lagoons of coastal San Diego County, including design options which could provide a net environmental benefit over the existing conditions.

S.9 NEXT STEPS IN THE ENVIRONMENTAL PROCESS

The Draft Program EIR/EIS is available for public review and comment and will be the subject at public hearings held throughout the corridor. Comments on the draft document may be submitted at the public hearings and in writing to the Department and to the FRA. After considering public and agency comment, the Department and FRA will prepare the Final Program EIR/EIS. The Final Program EIR/EIS will include responses to comments, and may identify the preferred alignments and station options to be implemented on a project-specific basis. It is important to note that the alignments and station options identified in this Program EIR/EIS are not intended or presented as a one-time construction effort, but as individual projects proposed for implementation over the course of the next 15 to 20 years, with each individual project providing an independent benefit as well as contributing to the overall improvement of the LOSSAN rail corridor.

At the completion of this program environmental process, the Department expects to certify the Program EIR/EIS and make findings for compliance with CEQA requirements. The FRA expects to issue a Record of Decision for compliance with NEPA requirements.

After completing the program environmental process, both the Department and FRA expect to be able to make various recommendations, including selection of a preferred Program alternative, i.e. the Rail Improvements Alternative or the No-Project/No-Action Alternative, and to the extent possible, selections of preferred alignment and station options to be advanced to the next phase of project development and environmental analysis. The Department, metropolitan planning organizations, rail operators, individual corridor cities, or any combination thereof may sponsor future consideration of component Rail Improvements projects.

This Program EIR/EIS considers the No Project and Rail Improvements Alternative at a corridor-wide, program level of environmental analysis. Project-level environmental review would focus on individual projects, a portion or portions of the LOSSAN rail corridor and would provide full analysis of potential impacts and issues at an appropriate level of detail in order to obtain the necessary approvals, permits and the ability to proceed with construction.

Comments on this document should be submitted to the following persons, who may also be contacted for additional information:

Patrick Merrill
Manager, Capitol Projects, South
Division of Rail
California Department of Transportation
1120 N Street
Sacramento, CA 95814
Phone 916-654-7543

David Valenstein
Environmental Program Manager
Office of Railroad Development
Federal Railroad Administration
1120 Vermont Avenue, N.W., MS 20
Washington D.C. 20590
Phone 202-493-6368

Visit the Department's Rail Web Site at

www.amtrakcalifornia.com

to view/download a copy of the Draft Program EIR/EIS,

or for a listing of libraries carrying a hard copy of the Draft Program EIR/EIS.